Section 1. Project Design & Review Checklist

This Section provides designers with a clear set of information that are needed to meet the State Sediment and Stormwater Management requirements on DelDOT projects. It contains the details and notes compiled from many designs for a clear Construction Plan presentation and has been revised and improved since it began in 1991.

There is nothing in this revision that requires any new or additional work on the part of a designer. Rather, all items in this revision are already being used in Plans. This revision simply documents good practices in Plan presentation. Consequently, please begin using this information on all new and current design projects.

Project Name: _____

Contract No.: _____

SEDIMENT & STORMWATER MANAGEMENT PROJECT DESIGN & REVIEW CHECKLIST

FOR THE

DELAWARE DEPARTMENT OF TRANSPORTATION

Introduction

All applicable information in the following checklist must be submitted to the Stormwater Engineer at the plan design stages indicated for any project disturbing over 5,000 square feet of land. Include this checklist with each plan submission. Mark the items "N/A" which do not apply to your project.

All erosion, sediment control and stormwater management measures must be designed in accordance with the latest version of the Delaware Sediment and Stormwater Regulations, DelDOT Standard Construction Details, DelDOT Standard Specifications and Design Guidance for drainage, erosion control and stormwater management.

Preliminary Project Submittal

Letter of transmittal

_____ 1. An appropriate letter of transmittal requesting review of the plans, specifications, and design computations.

Stormwater Management Report

_____ 1. A loose leaf binder containing the preliminary stormwater management report. Sections of the report shall be indexed and separated by tabs. The report shall include the following information:

- Project Description
- Discussion of the stormwater management approach being considered for each drainage area.
- Requests for any exemptions, waivers, or variances.
- Maps showing the information necessary to perform the hydrologic analysis.
- Back-up computations showing the existing and proposed peak rates of discharge from each drainage area.

See Section 2 of the ES_2M Design Guide for more information on how to assemble the stormwater management report.

Project Name: _____

Contract No.: _____

Preliminary Construction Plans

Title Sheet shall include (Contact Quality Management Section for the latest version):

_____ 1. Project Name and Contract Number.
_____ 2. A map showing the general location of the project in the State.
_____ 3. A map showing the general vicinity of the project at an appropriate scale. Mark project's beginning and end stations on this map.
_____ 4. Length of project.
_____ 5. Provide a signature block for the Stormwater Engineer.

General Notes, Legend and Project Notes sheets shall include (Contact Quality Management Section for the latest version):

_____ 1. Site Reviewer Requirement, stabilization of staging areas, and size of Disturbed Area within the limits of construction (LOC) in acres.
_____ 2. A legend showing plan designation symbols for all erosion, sediment control, and stormwater management practices.
_____ 3. "Project Notes For Sediment And Stormwater Management" .

Typical Section sheets shall include:

_____ 1. Locations and types of all roadside permanent seeding and mulching items. For instance, Soil Retention Blanket Mulch (SRBM) Type 3 on slopes steeper than 3:1 and outside limits of SRBM Types 5, 6 or 7. Straw Mulch or SRBM Type 4 on slopes 3:1 and flatter and on outside limits of SRBM Types 5, 6 or 7.
_____ 2. Call out that all grass ditches and swales are to be matted with SRBM Types 5, 6 or 7 based on design requirements.

Roadway Construction Plans Shall Include:

_____ 1. Proposed location of all permanent stormwater management facilities in schematic form only. Detailed grading and construction details will be developed by semi-final plan stage and shown in the Stormwater Management sheets of the Plans.

Project Name: _____

Contract No.: _____

Semi - Final Project Submittal

Letter of transmittal

_____ 1. An appropriate letter of transmittal requesting review of the plans, specifications, and design computations.

Stormwater Management Report

_____ 1. Submit any changes or corrections to the stormwater management report.

Semi - Final Construction Plans

In addition to the information required on the preliminary plans, semi- final plans shall include:

Profile sheets showing:

_____ 1. Profiles for all storm drain pipes

Quantity Summary sheets showing the following:

_____ 1. Contract Bid Items including all erosion, sediment control, and stormwater management practice bid items broken down by plan sheet and baseline stationing.

Stormwater Management Plans and Details showing:

_____ 1. Details for all permanent stormwater management facilities (i.e. pond outlet structures) shown on the construction plans including plan views, sections, profiles, notes, and any additional information as required to properly convey the intent of the design.

_____ 2. Grading plan of sediment basins (but not sediment traps) and stormwater management facilities. Existing and proposed grading contours of all temporary sediment basins and permanent stormwater management facilities shall be based on mean sea level datum and provided at one (1) foot intervals.

3. Spillway profiles, embankment profile, and pond cross sections showing pertinent design features such as:

_____ a) Side slope benching and stabilization such as topsoil, type of seed mix and mulch

_____ b) Forebay grading

_____ c) Outlet crest elevations

_____ d) Embankment elevation, as constructed (usually 5% of embankment height higher than as designed) and as settled (as designed)

_____ e) Phreatic line (usually 4 horizontal to 1 vertical)

_____ f) Profile along centerline of pond embankment showing top of dam, top and bottom of cutoff core , existing ground line, location of principal spillway, and Class A bedding under principal spillway.

Project Name: _____

Contract No.: _____

_____ g) Peak water surface elevations for each design storm
_____ h) Method of seepage control
_____ i) Scour protection at points of discharge
_____ j) Trash Racks (6-inch maximum spacing between all bars)
_____ k) Anti Vortex Devices
_____ l) Structural details of the pond's principal spillway including dimensions, strength of concrete, type and placement of reinforcing steel, etc.
_____ m) Maintenance Set-aside Areas for future disposal of sediment.
_____ n) Maintenance Access Road to pond.
_____ o) Pond Design Summary for each facility in accordance with the following table:

POND DESIGN SUMMARY

Design Storm	Facility Inflow	Facility Discharge	Water Surface Elev.	Storage Volume

Drainage area to SWM Facility: _____
Stormwater Quality Control: List the criteria followed. For example, the first 1/2" of runoff (wet pond); 2 inches Rainfall for other facilities.
Stormwater Quantity Control: List the criteria followed. For example, the 2, 10, 100 year storms to predevelopment peak rates (north of C&D Canal); the 2 and 10 year storms south of Canal.

_____ 4. Combine all information necessary to construct each pond (or the chosen stormwater management practice) on one sheet if possible. If more than one sheet is required, the information should be placed on successive sheets.
_____ 5. List Stormwater Management Maintenance Inventory Number on plans (number to be assigned by the Stormwater Engineer's office).

_____ **Notes in Pond Grading Sheet.** Below is a sample notes to be included in the pond grading sheet. The Designer may modify these notes to fit the field conditions.

Project Name: _____

Contract No.: _____

Pond Construction Notes

The stormwater management pond shall function as a sediment basin during roadway construction and shall be constructed in accordance with the following sections of the Standard Specifications:

Section 271- Stormwater Management Pond
Section 272 – Pond Outlet Structure, Concrete
Section 274 – Clay Borrow, Stormwater Management Pond

Construction Sequence

1. Install Stabilized Construction Entrance.
2. Clear and grub for installation of perimeter erosion and sediment controls
3. Install perimeter sediment controls as shown
4. Clear and grub remaining area for pond construction.
5. Construct partial embankment and cutoff core (if any) as needed to install the pond outlet structure. Construct Pond Outlet Structure and riprap energy dissipator at end of principal spillway. De-water work area as needed in accordance with Section 110.13 and use Sump Pit for pumping. Attach a Skimmer Dewatering Device to pond outlet structure and create about 2-foot deep of standing water in the pond.
6. Excavate the pond and complete the embankment, emergency spillway and basin to lines, grades and details shown in the Construction Plans. Over-excavate pond bottom as shown for sediment storage during construction. During excavation, the Contractor shall salvage and stockpile soils classified as CH, CL, CH and GM per the Unified Soil Classification System to be used to construct the foundation cutoff (if any) and embankment.
7. Stabilize all bare areas.

Maintenance of Pond as a Sediment Basin

1. Contractor shall inspect the basin immediately after every rain and make repairs as needed.
2. Contractor shall clearly mark the clean out elevation on a stake driven into the ground at a location clearly visible from the embankment. Sediment removed from the basin shall be disposed of at a location approved by the Engineer.

Conversion to Permanent Stormwater Management Pond

Project Name: _____

Contract No.: _____

1. Convert the basin into the permanent stormwater management pond after all areas draining to the pond have been permanently stabilized and the Engineer has approved the conversion.
2. Remove excess accumulated sediment, if any, above the designed pond bottom shown in the Plan and dispose sediment at a location approved by the Engineer.
3. Stabilize all bare areas. Remove erosion and sediment control measures and de-activate the Skimmer Dewatering Device.

Erosion & Sediment Control Phasing Plans shall include:

1. Series of plan sheets at a scale not smaller than 1" = 100' showing the following information:

_____ a) North arrow.

_____ b) Location of all erosion and sediment control measures designated by their standard plan symbol (see DelDOT Standard Construction Details).

_____ c) Stormwater flow arrows for all channels, ditches, and pipes.

_____ d) Sediment basin and/or Stormwater Management pond locations.

_____ e) The National Flood Insurance Program 100 year flood zone line.

_____ f) State and Federal wetlands accurately delineated.

_____ g) All tributaries and surface water bodies on the plan. If the surface waters are named, label them on the plans.

_____ h) Proposed location of all temporary soil stockpiles. Placement shall be located on areas with little or no slope, away from live streams and wetlands, with perimeter silt fence around base of pile.

_____ i) Sediment traps (not basins) and a summary table listing the following information:

Trap No.	Drainage area	Volume Provided	Length	Width	Bottom Elevation	Weir Crest Elevation	Clean Out Elevation

_____ 2. Sequence of Construction for each phase and stage of construction. A graphical presentation with notes annotating the general location and order of work is preferred:

a) Clearing and Grubbing of those areas necessary for installation of perimeter controls (i.e. silt fence, sediment traps, earth dikes, etc.).

b) Construction of perimeter controls.

c) Remaining clearing and grubbing for the project when the total disturbed area is less than 20 acres. Projects disturbing more than 20 acres must be phased in 20 acre increments.

d) Stream diversions and site dewatering.

e) Roadway grading, excavation and embankment.

Project Name: _____

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f) Specify which storm drains and inlets will be used or blocked during construction.
g) All cut and fill slopes of the highway excavation and embankment shall be permanently stabilized as the work progresses in increments no to exceed ten (10) feet measured along the slope.
h) Timing and location of temporary stabilization when this can be determined in advance.
i) Installation of stormwater management practices.
j) Final grading.
k) Final Stabilization
l) Conversion of sediment basins to permanent stormwater ponds.
m) Removal of temporary sediment control practices.

Final Project Submittal

Letter of transmittal

_____ 1. An appropriate letter of transmittal requesting review and approval of the plans, and specifications; and providing expected start and completion dates of construction.

Stormwater Management Report

_____ 1. Submit any changes or corrections to the stormwater management report.

Title Sheets showing:

_____ 1. Index of sheets listing the page numbers for all erosion, sediment control, and stormwater management plans and details.
_____ 2. Signature block signed and sealed by the Project Engineer (for final plans).
_____ 3. Submit the original title sheet to the Stormwater Engineer for signature and seal.

Quantity Summary sheets showing:

_____ 1. The actual quantity of each erosion, sediment control, and stormwater management practice bid item broken down by plan sheet and baseline stationing.